

What is claimed is:

1 1. A method of fabricating a shape memory alloy into a free standing thin film
2 structure comprising the steps of placing within a vacuum a cleaned substrate,
3 depositing a sacrificial layer on the substrate,
4 sputtering an amorphous shape memory alloy and depositing the
5 sputtered alloy in a thin film onto the sacrificial layer,
6 applying a chemical etchant to the sacrificial layer for a time which is
7 sufficient to etch the layer away to leave the thin film in a structure which is
8 free standing from the substrate, heating the thin film to an annealing
9 temperature which is sufficient to crystallize the shape memory alloy, and
10 cooling the free standing thin film.

1 2. A method as in claim 1 and further characterized in that the step of
2 depositing the sacrificial layer comprises depositing a material which can be
3 removed by an etching process that does not cause damage to the amorphous
4 shape memory alloy.

1 3. A method as in claim 2 and further characterized in that the material is
2 selected from the group consisting of chromium and aluminum.

1 4. A method as in claim 1 and further characterized in that the sputtered alloy is
2 deposited in a thin film having a thickness in the range of of $\sim 1\mu\text{m}$ to $\sim 40\mu\text{m}$.

1 5. A method as in claim 1 and further characterized in that the step of
2 annealing by heating is carried out while the the thin film remains deposited
3 ~~onto the sacrificial layer.~~

1 6. A method of fabricating a shape memory alloy into a free standing thin film
2 structure comprising the steps of placing within a vacuum a cleaned substrate,
3 depositing a sacrificial layer on the substrate,
4 sputtering an amorphous shape memory alloy and depositing the

5 sputtered alloy in a thin film onto the sacrificial layer,
6 heating the thin film to an annealing temperature while the thin film
7 remains deposited on the sacrificial layer, the annealing temperature being
8 sufficient to crystallize the shape memory alloy, and
9 applying a chemical etchant to the sacrificial layer for a time which is
10 sufficient to etch the layer away to leave the thin film in a structure which is
11 free standing from the substrate.

1 7. A method as in claim 6 and further comprising the step of cooling the free
standing thin film.

1 8. A product made by the method of claim 1.

9. A product made by the method of claim 6.